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# The occurrence of bats in the town of Hoyerswerda

## Występowanie nietoperzy w mieście Hoyerswerda

### Abstract

The occurrence of bats in the town of Hoyerswerda was investigated for the first time in 2001. The chief aim was to find roosts of house-dwelling species. Ultrasonic-detectors and mist-nets were used to locate and catch bats in their foraging areas. There were found ten species of bats, 12 nursery colonies, 40 summer roosts in buildings and 3 hibernacula. The most common species in the town were *Pipistrellus pipistrellus*, *Eptesicus serotinus* and *Plecotus auritus*. Shelters on attics and in crevices in buildings were used frequently. Most of the roosts (80.5 %) are threatened by forthcoming reconstruction works or demolition.

**Key words:** bats, summer shelters, town, protection

### 1. Introduction

Bats are among the most endangered mammals of Germany and all species are protected by law. At the moment reconstructions and demolitions of buildings are a particularly serious threat for bats and their roosts (SIMON 1998, BOYE et al. 1999, MEISEL 1999). While numerous shelters are being destroyed – whether consciously or unconsciously – new ones are only created on a very small scale. The protection of existing roosts depends on our knowledge of their locations. Therefore this work concentrates on house dwelling species and their roosts.

We owe the first records of bats in Hoyerswerda to Günter Natuschke, who discovered notably the nursery colony of *Barbastella barbastellus* and investigated a former colony of *Myotis myotis* (NATUSCHKE 1960).

### 2. Study Area

The town of Hoyerswerda is situated in the Oberlausitz Heathland in the North-East of Saxony. Hoyerswerda has 50,000 inhabitants and consists of an old part (about 730 years old) and a large recent part where residential blocks have been built since 1955. Furthermore five small villages adjoin the town: Schwarzkollm, Bröthen-Michalken, Dörghausen, Zeißig, Knappenrode. In the South-East the Spannteich nature reserve consists of wetlands surrounded by mixed forests. Hoyerswerda covers an area of about 88 km<sup>2</sup> and is surrounded by arable land, pine forests, ponds and large opencast mines.

### 3. Materials and Methods

In order to find roosts in buildings, 80 potentially suitable attics were visited. Swarming bats were observed at their roost, especially at dawn, and counted

during their emergence at the following evening. The inhabitants were informed through the local newspapers and asked to contribute with their own observations. Furthermore ultrasonic-detectors (Pettersson D 100) were used to find foraging areas and mist-nets to complete the list of occurring species (licence of Regierungspräsidium Dresden 16.02.01). The main part of the investigation took place between February and August 2001.

## 4. Results

### 4.1. Species composition

Ten species of bats were found in the whole study area (Tab. 1), where eight of them also reproduce.

*Pipistrellus pipistrellus* occurred in nearly all parts of the town. Five maternity colonies with 10 to 72 individuals used at least 14 roosts, where the bats stayed only temporarily, from a few days to a few weeks. The hunting grounds were mostly situated on the outskirts of the town where the bats foraged around deciduous trees.

Three colonies of *Eptesicus serotinus*

were found. The colony in the village of Knappenrode moved at least between nine attics of neighboured dwelling houses. In both Dörghausen and Bröthen, only one roost was discovered in each village, in respectively the attic of a church and in a wooden roller shutter. A single individual was observed emerging from an expansion joint in Hoyerswerda-Neustadt.

Foraging serotines were observed in nearly all parts of the town, also in areas where no roosts are known. They foraged mainly along wood-edges, tree-lines, over meadows and around groups of broad-leaved trees or pines within residential areas.

Summer roosts of *Plecotus auritus* were found in two parts of the town. One colony of at least 22 individuals used seven residential blocks, where the bats roost between concrete beams and the chimney, provided the crevices are small enough. Another colony of about 15 individuals was living in the attic of a two-storey dwelling house. Only 600 m away from there, a single brown long-eared bat was found hibernating in a cellar. A second hibernaculum is situated in a former bunker about 8.5 km away. *Plecotus austriacus* was present in the area of Knappenrode. Here

Tab. 1. List of species and methods of their investigation.

Tab. 1. Lista gatunków i metody, dzięki którym je stwierdzono.

| Species                          | Buildings search | Swarming behaviour at the roost | Emergence from the roost | Observation by sight and/or detector | Netting |
|----------------------------------|------------------|---------------------------------|--------------------------|--------------------------------------|---------|
| <i>Nyctalus noctula</i>          |                  |                                 |                          | X                                    | X       |
| <i>Eptesicus serotinus</i>       | X                |                                 | X                        | X                                    | X       |
| <i>Pipistrellus pipistrellus</i> |                  | X                               | X                        | X                                    | X       |
| <i>Myotis myotis</i>             | X                |                                 | X                        |                                      |         |
| <i>Myotis daubentonii</i>        |                  |                                 |                          | X                                    | X       |
| <i>Plecotus auritus</i>          | X                |                                 | X                        | X**                                  | X       |
| <i>Plecotus austriacus</i>       | X                | X                               | X                        | X**                                  | X       |
| <i>Barbastella barbastellus</i>  |                  |                                 | X                        |                                      |         |
| <i>Myotis brandtii</i>           |                  |                                 |                          | X*                                   | X       |
| <i>Myotis mystacinus</i>         |                  |                                 |                          | X*                                   | X       |

\* small *Myotis*-species

\*\* *Plecotus* sp.

a nursery colony of about 15 females used 4 attics and shared some of them with *Eptesicus serotinus*. In the mixed forest nearby two individuals were netted on their foraging flights. At a distance of about 500 m from the summer shelters two grey long-eared bats hibernated in the cellar spaces of a former factory, now the Knappenrode Mining Museum. Foraging long-eared bats were observed in the vicinity of the roosts circling around the crowns of broad-leaved trees.

*Barbastella barbastellus* occurred in Knappenrode as well. The already known colony of about 30 females lives behind the window shutters of two buildings, though the bats were not present during the whole summer season.

The only roost of *Myotis myotis* in the study area was situated in the roof spaces of a one storey concrete building within a shooting range and seems to be a shelter for single males.

*Nyctalus noctula* was observed foraging in different parts of the town, mainly on the outskirts, in the open space over meadows, uncultivated land and pine forests. Five juveniles and a male in mating condition were caught in the mixed forest of the Spannteich nature reserve near Knappenrode.

At the same site a lactating female and a juvenile of *Myotis daubentonii* were captured. This species foraged above

nearly all bodies of water in town, large groups were observed under the bridges of the Schwarze-Elster-Kanal and above the Bröthen lake.

*Myotis brandtii* and *Myotis mystacinus* were only caught once respectively. *M. brandtii* occurred in forest around Spannteich and *M. mystacinus* in the area of the Wusteteich pond.

#### 4.2. Roosts in buildings during the summer period

Six species of the study area live in buildings. Twelve nursery colonies of these species were discovered. It can be assumed that every colony knows and uses several roosts, even if sometimes only one roost was found. Nevertheless in 8 cases the existence of roost complexes consisting of different buildings was obvious. Therefore the number of roosts is much higher than the number of nursery colonies (Fig. 1).

More than 50 % of the roosts were situated in attics, where *Eptesicus serotinus* and both *Plecotus*-species hid between beams and rafters. Many roosts in cracks in the stonework of buildings (26.8 %) were expansion joints occupied by *Pipistrellus pipistrellus* and concentrated in residential blocks in the most modern part of the town. Two roosts were situated

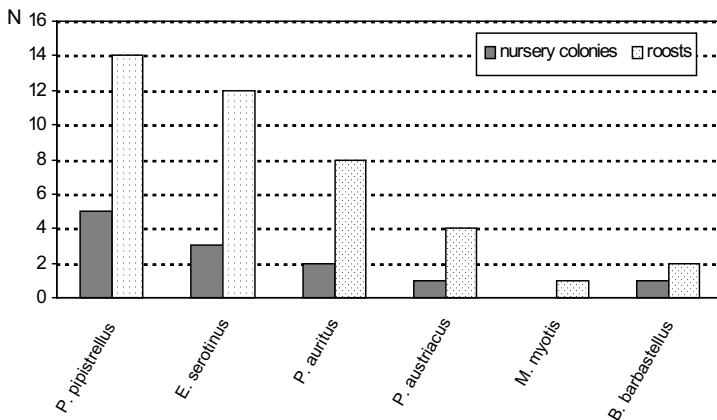


Fig. 1. Number (N) of nursery colonies and roosts of the house dwelling species.

Ryc. 1. Liczba (N) kolonii rozrodczych i schronień gatunków nietoperzy zasiedlających domy.

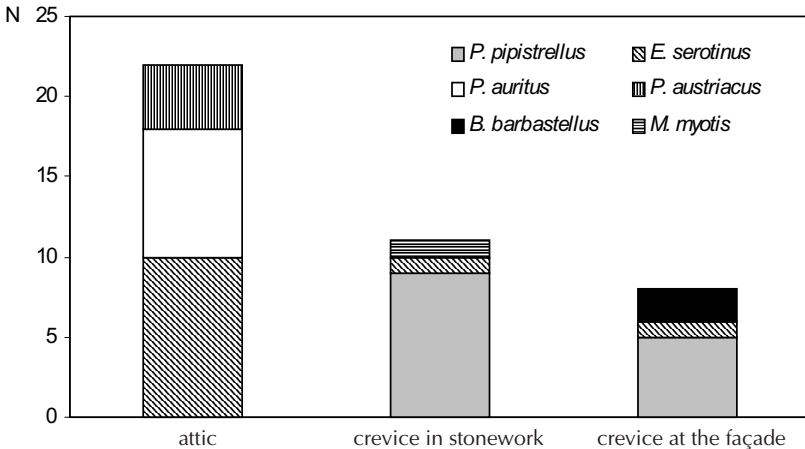


Fig. 2. The different types of roosts in and at buildings.

Ryc. 2. Różne typy schronień w budynkach.

in neighbouring concrete masts. Roosts on the façade (19 %) – behind slates, sheet-metal or window shutters – occurred mainly in the villages. The examples of summer shelters are shown in Fig. 3-5.

Many roosts (80.5 %) are threatened by forthcoming reconstruction works or demolition. Only for 19.5 % of the roosts in buildings seemed not to be threatened of destruction.

#### 4 . Discussion

*P. pipistrellus* is the most common species in the study area. It always occupies roosts in buildings, unnoticed by the house-owners in many cases. This is also connected with the roost switching behaviour of the pipistrelle bat (FEYERABEND and SIMON 2000) leading to a temporary use of several roosts. Therefore in numerous houses the bats are present only for a short period of time. The frequency of *P. pipistrellus* in Hoyerswerda confirms the classification of this species as very common and could be expected especially in the expansion joints of the residential blocks after observations in similar buildings in other regions (HERMANNNS

and POMMERANZ 1999). The results show that an intensive search for *P. pipistrellus* can produce more evidence of its occurrence (SCHÖBER 1999).

Another crevice dwelling bat is *E. serotinus*. Besides expansion joints and window shutters it favours roof spaces for roosting and is one of the common house dwelling species in the Oberlausitz Heathland (SCHMIDT and MAINER 1999). Here like in other regions every colony uses several buildings and changes roosts during the whole summer period (LUBELEY and SIMON 1998, SCHMIDT 1998). This behaviour was obvious in Knappenrode and could be concluded from counts of emerging bats and inspection of roosts in the other two villages too.

The foraging areas of the serotine in Hoyerswerda resemble those of other colonies in the Oberlausitz and it can be assumed that they are situated also in the vicinity of the roosts (SCHMIDT 2000). So the existence of some further colonies in certain parts of the study area can be supposed.

*P. auritus* which is able to use several types of roosts in buildings as well as in trees is a common species in Saxony

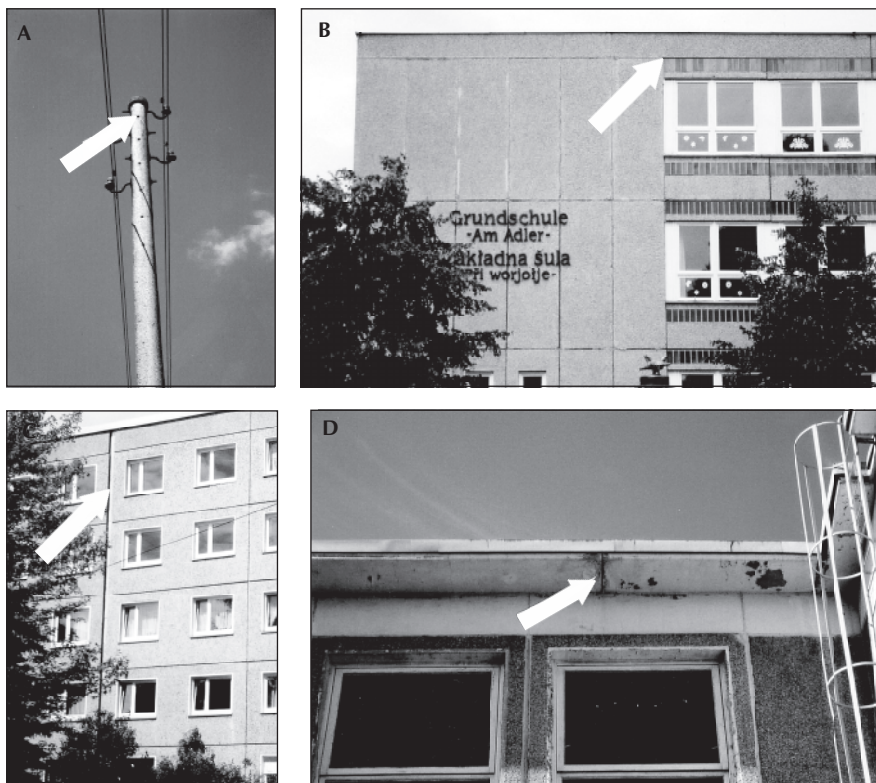


Fig. 3. The different summer shelters of *Pipistrellus pipistrellus*: A – in a concrete mast; B – in a crack above a window in a school building; C – in the expansion joint of a residential block; D – in a crack under the flat roof. Phot. Ch. Schmidt.

Ryc. 3. Letnie kryjówki *Pipistrellus pipistrellus*: A – w betonowym słupie, B – w szczelinie nad oknem w budynku szkoły, C – w przerwie połączenia płyt w bloku mieszkalnym, D – w szczelinie pod płaskim dachem. Fot. Ch. Schmidt.

(MAINER 1999). Indeed two colonies can be found in Hoyerswerda.

*P. austriacus* on the other hand lives exclusively in buildings and is rarer than the brown long-eared bat (SCHOBER 1999). Both species moved from one roost to another in neighbouring buildings during the summer season. They foraged not far from their roosts and hibernated in the vicinity too. Telemetric studies on both *Plecotus* species have shown that the existence of feeding habitats close to the roosts is important for roost selection (FUHRMANN and SEITZ 1992, FLÜCKINGER and BECK 1995, ENTWISTLE et al. 1997). The same

is probably true for hibernacula of these non-migrating species (SCHOBER and GRIMMBERGER 1987).

In the past *B. barbastellus* was frequently observed in the region of Silesia (SCHLOTT 1928). Today it is one of the rarest and most endangered species (RAU et al. 1999). Moreover it is difficult to find because of frequent changes of roosts (MESCHÉDE and HELLER 2000). In East-Saxony only five nursery colonies are known (SCHOBER and MEISEL 1999), one of them is situated in Knappenrode. Reports of inhabitants of bats found

behind removed panels or window shutters suggest that some more suitable roosts for this and other crevice dwelling species existed nearby only recently. It can be also supposed that the barbastelles roost also in the Spannteich nature reserve close to Knappenrode, because recent studies revealed that this species favours cracks behind bark for roost-sites (PODANY 1995, MESCHÉDE and HELLER 2000, STEINHAUSER 2002).

Whereas, in Hoyerswerda, a former colony of *M. myotis* (NATUSCHKE 1960) ceased to exist, some single males still roost in the town. The next known nursery colony is about 15 km away.

*N. noctula* occupies mainly holes in trees, which serve as roosts for reproducing, migrating and hibernating bats, therefore it relies on a network of roost-site trees, which are required for frequent changes of roosts and the typical mating behaviour of this species (MESCHÉDE and HELLER 2000). When these conditions are met, the noctule is a common species in the Oberlausitz Heathland (DIETZ 1995, SCHMIDT 1999, HOCHREIN 1999). The catching of five juveniles and a male in mating condition in the forest around Spannteich shows that Hoyerswerda belongs to the reproduction area of the noctule and serves as mating area as well.

Like in the whole Oberlausitz, *M. daubentonii* can be observed in Hoyerswerda above ponds, lakes and rivers. The roost-site trees in the Spannteich area in particular provide suitable roosting conditions for a nursery colony.

Comparatively little is known about the ecological requirements of *M. brandtii* and *M. mystacinus* (MESCHÉDE and HELLER 2000). Both species occur in the Oberlausitz (ZÖPHEL and WILHELM 1999) and were trapped in Hoyerswerda in their foraging

areas. Roosts within or near the study area remain to be found.

The results show that roosts and hunting grounds of bats are distributed over the whole study area, however roosts in stonework concentrate in newly build residential areas and other roosts in buildings are situated mainly in the villages and outskirts. The most important part includes the village of Knappenrode together with the Spannteich nature reserve, where a network of roosts in buildings, shelters in trees and different foraging areas provide resources for 7 species.

The preservation of the roosts found in buildings during future reconstruction is possible from a technical point of view in all cases (except for buildings to be demolished), particularly since a number of solutions to integrate roosts in buildings have been tested in the last years (MEISEL 1999, DIETZ and WEBER 2000). Another requirement is the consent of the house-owners and occupants. This involves intensive public-relations work to confer upon bats a very positive image and make people aware of the necessity to protect them and their roosts like it is being done in the course of the project „Fledermaus komm ins Haus“ („Bat, come into the house“) of the Foundation of Nature and Environment of Saxony (SCHMIDT 2001).

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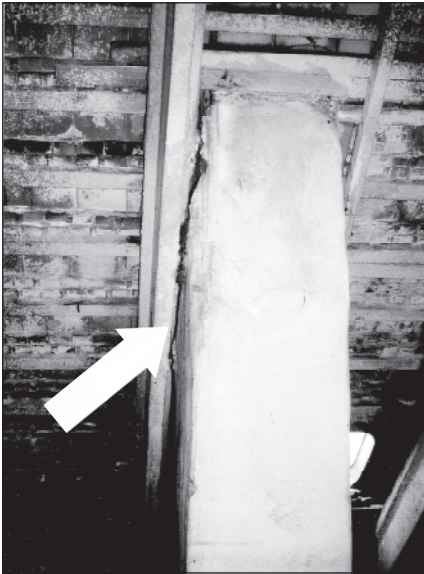


Fig. 4. The summer roost of *Plecotus auritus* in the roof of a residential block. Phot. Ch. Schmidt.

Ryc. 4. Letnia kryjówka *Plecotus auritus* na strychu budynku mieszkalnego. Fot. Ch. Schmidt.



Fig. 5. The summer roost of *Myotis myotis* above a shooting range. Phot. Ch. Schmidt.

Ryc. 5. Letnia kryjówka *Myotis myotis* nad strzelnicą sportową. Fot. Ch. Schmidt.

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## Występowanie nietoperzy w mieście Hoyerswerda

W 2001 roku przeprowadzono pierwsze obserwacje występowania nietoperzy na terenie miasta Hoyerswerda. Głównym ich celem było znalezienie kryjówek gatunków zasiedlających budynki. Nietoperze lokalizowano za pomocą detektorów ultrasonicznych lub odławiano w sieci na ich żerowiskach. Stwierdzono łącznie 10 gatunków nietoperzy, 12 kolonii rozrodznych, 40 letnich kryjówek w budynkach i 3 miejsca hibernacji. Najczęściej obserwowano następujące gatunki: karlika malutkiego *Pipistrellus pipistrellus*, mroczka późnego *Eptesicus serotinus* i gacka brunatnego *Plecotus auritus*. Głównymi kryjówkami nietoperzy były strychy i szczeliny w budynkach. Większość schronień (80,5%) jest zagrożona na skutek przewidywanych remontów lub wyburzeń budynków.

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